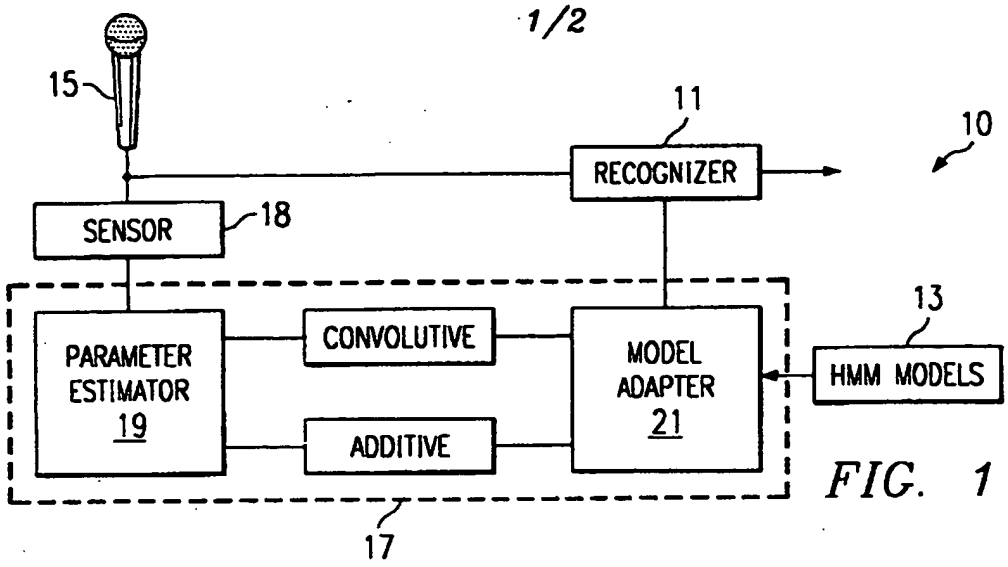
15
11
10
RECOGNIZER
SENSOR
18
13
PARAMETER ESTIMATOR 19
CONVOLUTIVE
ADDITIVE
MODEL ADAPTER 21
HMM MODELS
17

FIG. 1

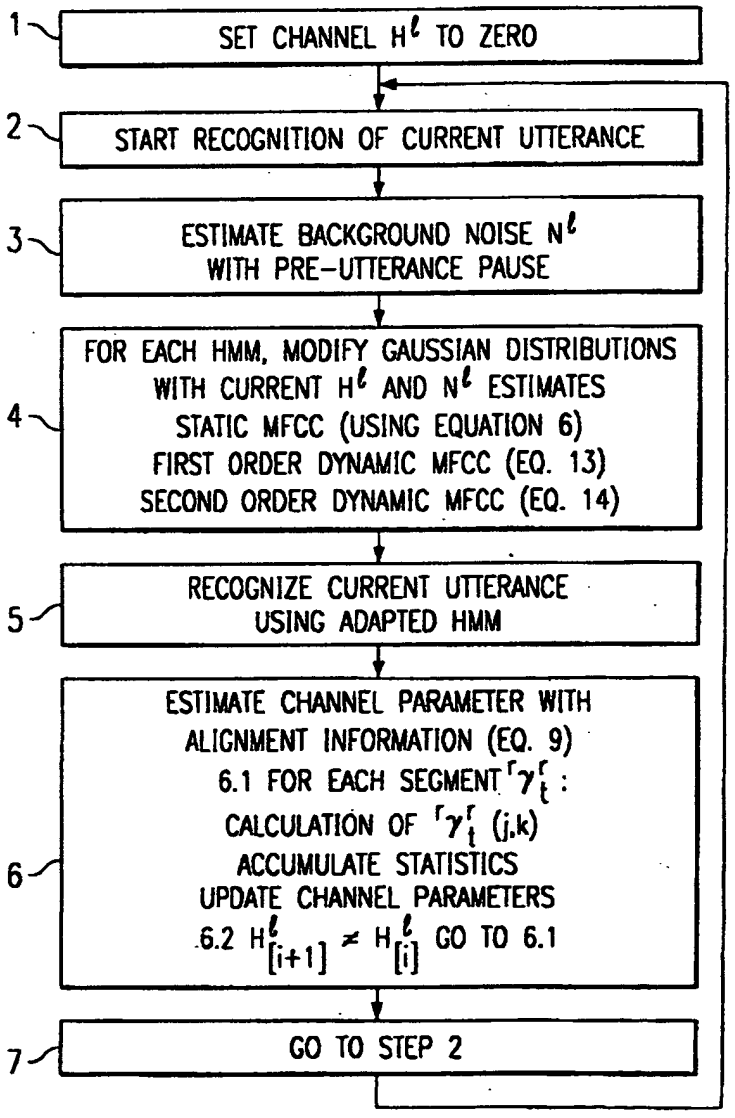
1
SET CHANNEL H^{ℓ} TO ZERO
2
START RECOGNITION OF CURRENT UTTERANCE
3
ESTIMATE BACKGROUND NOISE N^{ℓ} WITH PRE-UTTERANCE PAUSE
4
FOR EACH HMM, MODIFY GAUSSIAN DISTRIBUTIONS WITH CURRENT H^{ℓ} AND N^{ℓ} ESTIMATES
STATIC MFCC (USING EQUATION 6)
FIRST ORDER DYNAMIC MFCC (EQ. 13)
SECOND ORDER DYNAMIC MFCC (EQ. 14)
5
RECOGNIZE CURRENT UTTERANCE USING ADAPTED HMM
6
ESTIMATE CHANNEL PARAMETER WITH ALIGNMENT INFORMATION (EQ. 9)
6.1 FOR EACH SEGMENT $^{r}\gamma_{t}^{r}$:
CALCULATION OF $^{r}\gamma_{t}^{r}(j,k)$
ACCUMULATE STATISTICS
UPDATE CHANNEL PARAMETERS
6.2 $H^{\ell}_{[i+1]} \neq H^{\ell}_{[i]}$ GO TO 6.1
7
GO TO STEP 2

FIG. 2

FIG. 3

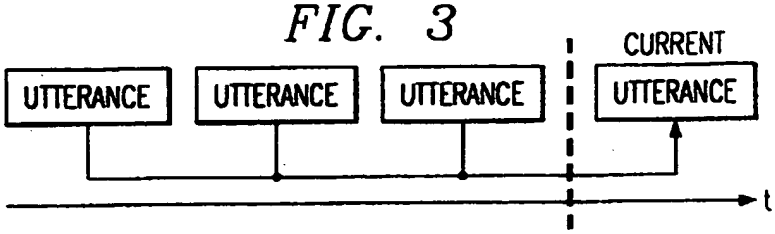

FIG. 4

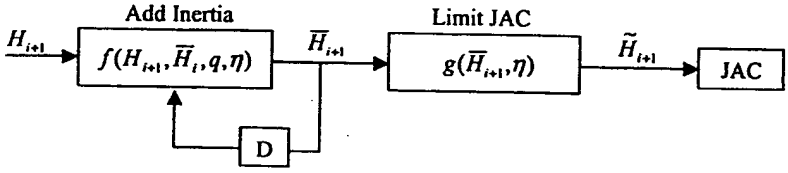

FIG. 5

Aurora 2: Clean training, multicondition testing – MFCC-OD, E-JAC														
	Test Set A					Test Set B					Test Set C			
	Subway	Babble	Car	Exhibit	Average	Restaurant	Street	Airport	Station	Average	SubwayM	StreetM	Average	Average
20 dB	99.11	98.76	99.08	99.07	99.01%	99.03	98.73	99.25	99.29	99.08%	99.08	98.61	98.85%	99.00%
15 dB	98.74	98.19	98.66	98.40	98.50%	97.76	97.94	97.98	98.70	98.10%	98.53	98.07	98.30%	98.30%
10 dB	97.42	95.47	97.44	96.79	96.78%	94.88	95.62	95.59	96.79	95.72%	97.36	95.65	96.51%	96.30%
5 dB	93.37	88.57	94.39	90.81	91.79%	88.12	90.08	90.25	91.27	89.93%	93.21	90.66	91.94%	91.07%
0 dB	81.30	65.90	80.05	76.98	76.06%	68.50	73.25	75.66	74.45	72.97%	78.45	71.80	75.13%	74.63%
Average	93.99	89.38	93.92	92.41	92.43%	89.66	91.12	91.75	92.10	91.16%	93.33	90.96	92.14%	91.86%